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MANAGEMENT OF LOG INVENTORIES[1/]

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Within recent years the use of log decks has become customary for sawmills where logging operations are to be discontinued or are maintained on a reduced basis during winter months. Surplus logs cut during spring, summer, and fall are stored for winter sawing in decks often hundreds of feet long, and of various heights, depending on the handling equipment available at the individual mill. Log supplies thus stored often exceed what is needed for winter mill operation.

At some mills logs that have remained in this kind of storage for several years are now beginning to show signs of deterioration. Ends of such logs have developed deep checks, and, in some of them, serious decay and stain are evident. Both stain and decay may result in considerable dollar loss to the sawmill. This loss takes place in two ways: first, from the excessive trim of the boards sawed from those logs that show serious checks and end decay, and second, from the stain, which lowers the quality of the lumber. One company has estimated that loss from end checks alone amounted to 3 percent of the mill's total output. This loss arises from nonproductive sawtime as well as from trim wastes. Another company estimated that 20 percent of the sapwood of decked logs was lost because of decay and stain fungi.

Control Measures

Probably the best way to reduce such losses, and the one frequently ignored by sawmill managers, is to maintain accurate log deck records and then to use the logs in the same order in which the decks were accumulated. This practice holds losses from checking, stain, and decay to a minimum. Since decked logs that contain stain and decay fungi often serve as focal points from which infection may spread to adjacent logs, a reduction in storage time reduces, correspondingly, the danger of spreading such infections.

1/ This paper reports a study conducted by Helmuth Resch, sponsored by the Intermountain Forest and Range Experiment Station, in cooperation with the J. Neils Lumber Company of Libby, Montana.

A second method of reducing the possibility of stain and decay infection is to install a cindered or hard road system in the storage area. Installation of a road system facilitates the use of mechanical handling equipment and improves the efficiency of log handling during the winter and wet seasons. By covering the bare ground, such roads partially eliminate another possible source of fungi.

When logs must be stored for relatively short periods of time, several control measures can be used to reduce attack by fungi. One method is to immerse the logs in a fungicide solution prior to storing; another is to paint the log ends and all debarked areas with such a solution. These are only temporary protective measures, as subsequent exposure removes most of the solutions.

For long-term log storage the method most frequently used involves keeping the moisture content of the logs above the fiber saturation point (approximately 28 percent) by using a log pond or by using a suitable sprinkling system. This latter method has proved good enough to justify more widespread use.

Losses from end-checking can be reduced by painting log ends with a bituminous or asphalt paint. The paint layer acts as a barrier and reduces the loss of moisture from the log ends, the principal cause of checking. Sprinkling the log ends with water is an equally effective way of preventing checks and appears to be the simplest and most economical method of preserving logs in long-term storage.

Comparison of Sprinkling Systems

During the past year the effectiveness of top and side sprinkling of log decks has been studied. The practice of sprinkling to prevent the growth of fungi is not, of course, new. The pulp and paper industry has used portable sprinkling systems for a number of years to maintain adequate moisture in stockpiles of pulp bolts and chips to reduce fungi losses as well as fire hazards. However, use of these portable systems with sawlog decks is a more recent practice.

The usual practice has been to lay pipe along the top of each log deck with spray heads at intervals close enough to insure spraying the entire log area. A similar sprinkling system made of 3-inch pipe with rotating Rainbird sprinklers attached every 40 feet was laid on the top-center of the log deck and was used in the study here reported (fig. 1).

A second sprinkling system was made by removing the sprinklers from a portion of the 3-inch center pipe and attaching 1-inch pipes perpendicular to the main supply pipe. These smaller pipes extended about 5 feet beyond the side of the log deck. A tee with two sprinkler heads was attached to the projecting end of the lateral supply pipes (fig. 2). This system sprayed the log ends.

Figure 1.--Rainbird--rotating sprinkler.

Figure 2.--Sprinkling from the side. One nozzle sprays water over the top, the other over the log ends.

To verify the apparent effectiveness of end sprinkling, three 16-foot logs, cut from newly felled trees, were hauled to the log storage yard. Log 1, the control, received no treatment; log 2 was sprayed continuously on both ends; log 3 was kept soaked at both ends by means of tight rubber caps filled with water.

After 60 days, the log ends were examined, checks were measured, and the logs were sawed. The average depth of the end checks in the control log was 3.3 inches in the west end and 3.4 inches in the east end. No checks appeared in either of the other two logs. The sapwood boards from the control log were heavily bluestained, whereas the boards from the other logs showed no stain discoloration.

Discussion

Sprinkling from the top has the advantage of wetting a greater log surface than sprinkling the log ends and sides. Top sprinkling also produced better water penetration into the interior of the deck than did end sprinkling. Bark prevents the rapid absorption of the sprayed water by the logs, but evaporation of the unabsorbed water often cools the surrounding air below the optimum temperature for fungus growth (75° to 90° F.). The top-sprinkling system is easily and rapidly installed on the surface of the log deck. The principal disadvantage of top sprinkling is that it does not sufficiently wet the log ends, where most damage occurs.

In contrast to top sprinkling, spraying from the sides wets the log ends and thus retards both checking and fungus growth. The disadvantages of side sprinkling are: (1) the greater cost of material for the sprinkling system and the slightly greater installation cost; and (2) the fact that the interior of the pile is not wetted. This latter disadvantage is serious since stain and decay fungi may attack exposed wood on the log surfaces.

Since each system studied has inherent disadvantages, a suitable combination of the two systems that would provide both top and side sprinkling is recommended. Such a system, properly installed, will give maximum protection to logs placed in long-term storage decks.

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